

eleven years, I should have expected to find on the main river, as the rarer and more beautiful genera seem to be found there more frequently. However, one or two of the specimens were taken in town, and may belong to either region; and I think very likely that *calidum* (Fab.) is found up the river in the fields.

The genera I have observed upon both the main river and the affluent are *Scarites*, *Brachynus*, *Platynus*, *Pterostichus*, *Chlaenius* and *Harpalus*. I think I have also taken *Galerita* on the affluent, but such occurrence is rare. *Brachynus* and *Chlaenius* are much more abundant on the main stream, as indeed are nearly all of those given. I know of only two specimens of *Brachynus* being taken on the affluent, while in damp or wet places on the main river, which are much better suited to them, they are quite plentiful. Of the genera *Carabus* and *Cychrus*, I have never met with a representative here in any section.

This distribution is undoubtedly due to the richer flora of the main river producing more varied species upon which the *Carabidæ* prey, and also to that to which in turn the richer flora is due, namely, the richer soil and more favorable locality.

MONOGRAPH OF THE EMBIDINA.

(Continued from page 155.)

BY DR. H. A. HAGEN, CAMBRIDGE, MASS.

6. *Oligotoma Westwoodi*, n. sp.

O. Westwoodi Hag., Synops. Embid., p. 222 (no description, not named.)

Length of body $4\frac{1}{2}$ mill.; exp. of wings 7 mill.

Male: As the specimen is enclosed in copal (*Gummi anime*), the colours are not certain, but the head, with antennæ and palpi, the thorax and the legs in part, seem to have been blackish-fuscous; head more *Raphidia*-like than in any other species; more than half longer than broad; the rounded sides sloping down, the occiput less than half as broad as the front part with the eyes; head above slightly convex, epistom large, convex; eyes large, prominent, about orbicular, with a small ex-

cision for the insertion of the antennæ; facets large, globose; antennæ long, reaching the end of the metathorax, inserted in a longer socket, 15-jointed; 1st joint a little thicker, cylindrical, half as broad as long; 2nd as long as broad; all others obclavate, to three times longer than broad, but the 3rd to 5th a little shorter than the rest, the last one more ovoid, with tip rounded; there seems not to be wanting any joint more. Labrum large, rounded, a little darker in middle; max. palpi 5-jointed, the three basals alike, short, as broad as long; 4th a little longer, 5th longer, ovoid; labial palpi 3-jointed, apical joint longer, ovoid. Prothorax as broad as occiput, about quadrangular, broader near the mesothorax; a deep transversal sulcus a little before middle, where the sides are notched; legs as usual, femoral and basal joint of fore legs elongate-inflated; middle legs less strong.

Wings very little longer than the abdomen, narrow, $\frac{3}{4}$ mill. broad, four times longer than broad, rounded on tip, hairy around and on the membrane, which is rugose, smoky, with four white longitudinal bands, the fifth near the costa being almost obsolete. Subcosta dark, ending unconnected after the basal fourth of the wing; a little earlier in the hind wings. Radius a little before the tip of the wing connected below with one long vein, which runs parallel to the radius and ends on the tip. This vein represents the sector and its upper branch (McLachl.); the sector itself is wanting from the place where the upper branch originates (it is marked by a small break of the vein) to the tip. There is no other vein in the wing except the strong anal vein originating from the base of the sector shortly before a transversal between the sector and radius. I have for convenience always used McLachlan's names of the veins, though it is obvious by this species that what he calls upper branch is really the prolongation of the sector itself. I will try later to give a homology of all the veins of the wing. The hind wings have exactly the same very simple venation; the discoidal cell is open. The abdomen is not entirely visible from above, as a Hymenopterous insect, partly overlaying. The segments are equal, once broader than long, except the two last ones, which are considerably shorter; the apical margin of the last one is cut asymmetrically, the right half of it considerably shorter than the left side; appendages as long as the four last segments, stout, two-jointed; the apical joints cylindrical, rounded at tip, as long as the basal ones; the appendages are asymmetrical, the right one stout, straight, a little longer, the left one curved, a little thinner. No side-view is possible. Between

the appendages is projected a broad inflation, narrower on tip, and just on its middle a spine coming from the right, as long as the basal joint, cylindrical, sharp on tip, somewhat curved to the right; a much smaller and shorter spine on the left side does not exceed the inflation. Abdomen from below with penultimate segment as long as the others, very dark, blackish; last segment pyramidal, rounded on tip, the left side asymmetrical, stronger notched.

In the same lot of copal I received another specimen of exactly the same size, but differing as follows: The whole insect has copal colours, less dark, only the head is dark brown. Both antennæ are only 14-jointed; the apical joint is ovoid, without any traces on tip of a broken-off segment. Wings pale, but with obvious traces of a smoky color and white longitudinal bands; the discoidal cell is closed in all four wings by one strong transversal vein, and two in the left anterior wing; all wings show 4 to 5 small costal transversals in the apical half, but these may also exist in the other specimen, the costal margin of which is not plainly visible.

The venation is alike, but all veins not developed are indicated by a series of small, darker hairs inserted in a more visible and deeper hole. I have formerly pointed out that just the same occurs in the wing cases of the *Calopteryx* nymphs. The appendages are to be seen well from below; they are alike; the right spine is longer, less thick, bifid on tip; near by is a short, cylindrical, curved tube, with open end; the left spine is triangular at base, the apex twisted and sharply pointed.

One joint more or less of the antennæ, one transversal more or less in the wing, can of course not be a specific difference. The marked character of the right spine between the appendages would be of importance, if it would be possible to examine the same organ in the other specimen. This is not the case, and therefore the existence of a similar character is at least not impossible.

Hab.—I received both specimens forty years ago among other copal insects bought from the large Drogues House Gehe in Dresden, Germany. It was sold as East Indian copal. Later I discovered that all copal sold at that time as East Indian copal came from Salem, Mass. It is indeed probably Zanzibar copal; this trade was then entirely in the hands of Salem merchants; the copal was brought to Salem by the extensive East Indian trade of this city, and sold to Europe.

I request the honor of dedicating this gentle species, the smallest

known, to the first monographer of *Embia*, the Veteran Entomologist—Indefatigatus, Doctissimus!

The rudimentary venation separates this species from all known, by the want of the lower branch of the sector.

Prof. Westwood in his monograph, l. c., p. 374, mentions two apparently distinct species in gum copal, probably from the eastern coast of Africa, in the collection of Dr. Strong, of Brook Green—"one which from its size may probably be the *Embia Savignyi*; seemed to possess 14-jointed antennæ." The size of *E. Savignyi* is so much larger that this copal species can not be *O. Westwoodi*.

The other species was of still larger size, with slightly stained wings and 24 joints in the antennæ. Both are unknown to me.

The published copal insects contain no *Embia*. A careful examination of the large collection of copal insects here did not give any more *Embia*.

7. *Oligotoma nigra*, n. sp.

Embia nigra Hagen, Synop. Psoc. et Embid., l. c., p. 221-222 (no description).

Male, dry: Length of body 8 mill.; exp. of wings 13-15 mill. Head dark fuscous, a little shining, sparingly covered with small pale hairs; head a little longer than broad; the part behind the eyes narrower, rounded, nearly orbicular; above slightly convex; eyes large, black; epistom quadrangular; labrum large, fuscous in middle, rounded; antennæ longer than head and prothorax, 13 joints present, fuscous, very hairy, hairs long, brown; 1st joint cylindrical, a little thicker than the others, once longer than broad; 2nd cylindrical, short, as long as broad; 3rd as long as 1st, larger on tip; 4th to 6th short, very little longer than broad, thicker on tip, 5th and 6th longer and thicker than 4th; 7th to 9th about alike, similar to the preceding ones, but longer; 10th to 13th longer, about four times longer than broad, more cylindrical; rest wanting. Another specimen has also 13 joints, but here the 10th to 13th are not so elongated; perhaps the difference is caused by the preparation. Mandibles strong, brown, with three black sharp teeth on tip; the right mandible has the inner teeth shorter; max. palpi 5-jointed, the two apical ones longer, the last one ovoid; lab. palpi 3-jointed, fuscous, the apical longer, ovoid; labium pale, rounded, bifid; head below brown, mentum blackish. Prothorax brown, much narrower and shorter than the head, a little longer than broad, and dilated to the wings; sides oblique; a transversal sulcus

after the apical third ; the sulcus prolonged near the sides towards the base, inclosing an elevated part (les trois festons de Rambur).

Wings smoky fuscous, the median and the anal veins darker, blackish ; five longitudinal white bands ; four to five fine costals in the apical part ; two (in one hind wing, four) transversals in the cell. Legs brown, articulations paler ; dilated in the usual way, so far as it can be observed, the 1st joint of tarsi not very much dilated. Abdomen brown, last segment nearly cleft by a deep sulcus, nearer to the right ; appendages long, very hairy ; basal joint longer than the last segment, apical joint longer and thinner ; right spine long, slowly thicker towards the base ; tip sharp, bent up a little ; this spine is turned strongly to the left, as long as the intromittant, cylindrical tube ; the left spine is half as short, the sharp apical end returned. I can not ascertain if there is any asymmetry of the appendages.

The description is made from three males, showing the smaller dimensions, collected in Upper Egypt ; the fourth, a little larger and much darker, collected near Cairo, is alike ; the end of the abdomen is not visible.

Female ? dry. Length of body 10 mill.

The two females before me differ from the males by similar characters as *O. Michaeli*. The body is black, a little hairy, somewhat shining, except the head, which is finely aciculate above. Head more rounded, the eyes small, not prominent ; antennæ (only 13 joints present) short ; 1st joint thicker, cylindrical ; 2nd very short, annular ; 3rd longer, larger at tip ; all the following alike, short, nearly globular ; the 2nd to 4th joint a little paler than the others, which are blackish. Prothorax a little broader than in the male ; mesothorax longer, narrower towards the prothorax, without any traces of wings ; metathorax similar ; legs black, articulations paler ; the enlarged parts, principally the basal joint of the tarsus of fore legs, stronger developed and more enlarged. An external spine on the basal joint is perhaps present. Abdomen longer, black ; last segment rounded on tip ; the appendages thick, very short, the apical joint a little longer ; the abdomen of these carded specimens can not well be examined, but I believe that I am seeing a female genital opening. I can not find any asymmetry.

Hab. The larger winged male and the two females, called larvæ by Prof. Schaum, were collected by him on the island of Rhoda, near Cairo, Egypt, end of January, 1851, by beating the grass with the net in the

evening. The winged one was very agile in flying. Of the wingless ones he never took more than two at one beat, and they moved around like a slow Staphylin. They were very rare in February. The smaller ones were collected by him in February, 1852, in Middle and Upper Egypt. They are said to be very common in summer.

The winged *O. nigra* is entirely different from *E. mauritanica* Lucas. In 1857 I had the opportunity of seeing the only copy of the splendid and very expensive Explor. de l'Algerie then existing in Germany, belonging to the R. Library in Berlin. Even then, the copy being at the binder's, I had only a hurried glimpse, together with the late Prof. Schaum, who believed his species to be identical with the species of Mr. Lucas. This explains the question mark after *E. nigra* in my Synopsis. Now I have this expensive work in my room! I remark this fact only to explain the difficulties with which entomologists had to contend thirty years ago. That the winged specimens are different from *E. Savignyi* is directly obvious. I can not decide if the wingless form belongs to the winged one. Prof. Schaum considered it to be the larva, but as it is of the same size with the winged, this is scarcely probable, except (being females) by assuming that the female imago is much larger. The symmetrical appendages are very different from those of the males, and it could be presumed that the wingless form belongs to *E. Savignyi*; but this species seems to be different. Therefore we have to wait for new observations. As I received first the black wingless form, I applied to it the name *E. nigra*, which I would not change as the name had been quoted by several authors.

A wingless specimen collected by the late Prof. Loew in Asia Minor, probably near Kellemisch, is similar, but less dark. The pinned specimen, 8 mill. long (last segment wanting), may belong to *O. nigra*. Head and prothorax similar, antennæ short, with 17 joints. The color of the abdomen below yellowish brown. The condition of the specimen is too indifferent to say more than to note the occurrence of a species similar to *O. nigra* in Asia Minor.

8. *Oligotoma antiqua*.

Embia antiqua Pictet and Hagen. Berendt Bernstein Ins. ii., p. 56, pl. 5, f. 7.

Male? wingless. Length of the body 10 millim.

Body dark, sparingly villous; head oblong, a little narrower behind and rounded; above light convex, smooth, depressed behind the eyes,

which are small, not prominent ; antennæ as long as head and prothorax, 18-jointed ; 1st cylindrical, thicker ; 2nd very short ; 3rd as long as 1st, the rest shorter, thicker on tip, the last one ovoid ; max. palpi 5-jointed, the last one fusiform, longer ; labial palpi 3-jointed, the last longest ; labrum rounded ; epistom short, broad ; prothorax narrower and shorter than the head, quadrangular, sides straight, front angles sharp, hind angles rounded, a transversal sulcus in the frontal third ; mesothorax quadrangular, longer than prothorax, near the front margin on each side an oblique impression, and behind a small horizontal one ; metathorax similar, but shorter ; no traces of wings. Abdomen with 9 oblong dorsal segments, the 8th shorter, apical margin notched ; 9th large, conical, with a strong longitudinal impression, nearer to the right ; below 8 segments, the last large, ovoid ; appendages strong, very villous ; apical joint thinner, cylindrical ; the basal a little curved ; legs strong, villous, femora of fore and hind legs and basal joint of tarsi of fore legs largely inflated.

Hab. Four specimens in Prussian amber ; I have little doubt that it belongs to *Oligotoma* ; the apparent asymmetry of the last dorsal segment makes me believe that the appendages are also asymmetrical, as I had seen them so when studying the specimens ; but these parts were not well visible. I have amended the description after manuscript notes, namely, the antennæ, which are there given with 19 joints, because the socket is counted as 1st joint. Since then more specimens have been found, but no winged ones.

9. *Embia Savignyi*.

Savigny Descript. d'Égypte Néuropt. pl. 2, f. 9-10 (no name).

Embia Audouin Expl. sommaire du planches, p. 194.

E. Savignyi Westwood, Trans. Linn. Soc., vol. xvii., p. 372, pl. ii., f. 1.

E. Savignyi Burm., Handb. vol. ii., p. 770, 1.

E. Savignyi Ramb., Neur. p. 311, 1.

E. Aegyptiaca Blanch., Hist. Ins. p. 48. (Not seen by me.)

E. Savignyi Brauer., Neur. Europas, 1876, p. 32.

Length of the body 9 mill. ; with wings, 12 mil. ; exp. of wings nearly 20. The measures are only approximative, the condition of the specimen not allowing more.

Male. Body leather-yellow, somewhat shining, villous ; head about quadrangular, rounded behind, rather flattened above, a little depressed transversely behind the eyes ; antennæ broken (Burmeister quotes 17 joints, Savigny figures only 15) ; eyes large, black, notched before ; max.

palpi 5-jointed, brownish. Prothorax much narrower than the head, enlarged towards the wings; a little longer than broad, sides straight; in the anterior third a transversal sulcus; behind convex, divided by an impressed middle line. Mesothorax with a transversal elevation divided in the middle between the base of the wings. Legs a little darker with the usual dilatation of femur and the basal joint of tarsi of fore legs. Wings longer than the abdomen, a little broader than those of *Oligotoma*, light brownish-smoky, with five longitudinal white bands; the inferior branch of the sector is again furcated (and occasionally a third time, as in one wing of Savigny's figure and in the specimen before me). Four to five partly incomplete costal transversals, two in the closed cells, and several more in the two or three spaces between the sector-branches. Abdomen enlarged behind, last ventral segment larger, convex, shining, brown. Appendages broken; two-jointed, long, thick, after Savigny and Rambur. I presume the specimen to be a male, because no female genital opening is visible.

There exists no description of Savigny's type except Rambur's of the incomplete specimen in the Jardin de Plants in Paris, which has probably been figured by Savigny. Burmeister has described some specimens in the Museum in Berlin, Prussia, and my specimen is one of them.

Hab. Egypt, Savigny and Ehrenberg in Berlin Museum.

The figures by Savigny are excellent, as usual; it is to be remarked that he has seen and figured f. 9, u. e., the opening of the spinning glands inside of the labium.

Rambur, l. c., p. 312, carefully describes a larva which belongs very probably to this species. The patria of the larva, which is now in De Selys-Longchamps collection, is unknown. Perhaps it may be a female.

A wingless specimen collected by Prof. Schaum near Athens, Greece, November, 1851, now in my collection, agrees very well with Rambur's description; 10 mill. long, brownish-ferruginous, villous; the end of the abdomen of the carded specimen is not well visible. The head is a little more oval and not so distinctly quadrangular as in *E. Savignyi*. Antennæ short, 17 joints. The body is narrower than in *E. Savignyi*. Otherwise it has the characters described before as belonging to the female, namely, the small, non-prominent eyes, and the external spine of the basal joint of tarsi of fore legs. Of course it can not be decided if this specimen belongs to *E. Savignyi* or not. Prof. Schaum had also collected a winged specimen at the same place, which was unfortunately lost. Prof. Brauer, l. c., quotes this species from Southern Russia with ? (authority not stated).